

CLAIMS

1. An image recording apparatus comprising:

an image forming medium which extends over at least one platen and comprises an image receiving layer,

5 an image recording section having at least one ink-jet head which faces the image receiving layer of the image forming medium on an outer periphery of one platen of said at least one platen, and

an image transfer section having

10 an image receiver and

an image transfer heat medium which faces the image forming medium in its back side,

wherein the image forming medium comprises a laminate of an aqueous solvent permeating layer and the image receiving layer which are laminated on and in the
15 above listed order from a substrate for the image forming medium.

2. An image recording apparatus comprising:

an image forming medium which extends over at least
20 one platen and comprises an image receiving layer,

an image recording section having at least one ink-jet head which faces the image receiving layer of the image forming medium on an outer periphery of one platen of said at least one platen, and

25 an image transfer section having

an image receiver and

an image transfer heat medium which faces the
image forming medium in its back side,

wherein the image recording section comprises an
5 image drying mechanism which accelerates drying of an
image recorded on the image receiving layer of the image
forming medium.

3. An image forming medium comprising a laminate
wherein an aqueous solvent permeating layer and an image
10 receiving layer are laminated on a substrate for the image
forming medium in the above listed order from the substrate.

4. An image recording apparatus comprising:

an image forming medium which extends over at least
one platen and comprises an image receiving layer,

15 an image recording section having

at least one ink-jet head which faces the image
receiving layer of the image forming medium on an outer
periphery of one platen of said at least one platen and

an image drying mechanism which accelerates
20 drying of an image recorded on the image receiving layer of
the image forming medium, and

an image incorporating section having

an image receiver and

an image incorporating heat medium for
25 integrating the image forming medium with the image

receiver which faces the image forming medium in its back side.

5. An image recording apparatus comprising:

an intermediate support which forms a closed loop and
5 extends over at least one platen,

an image receiving layer transfer section having

an image receiving layer transferer which
includes an image receiving layer and

an image receiving layer transfer head which
10 faces a part of the intermediate support on an outer
periphery of one platen of said at least one platen,

an image recording section having at least one ink-jet
head or toner-jet head which faces a part of the
intermediate support on an outer periphery of one platen
15 which is the same as or different from said one platen, and

an image transfer section having

an image receiver and

an image transfer heat medium which faces the
intermediate support inside the closed loop,

20 wherein the intermediate support comprises a
substrate and a coating film, and

the coating film is formed by applying a coating
composition for forming the coating film on at least one
main surface of the substrate by using a spraying method.

25 6. An image recording apparatus comprising:

an intermediate support which forms a closed loop and extends over at least one platen,

an image receiving layer transfer section having

an image receiving layer transferer which
5 includes an image receiving layer and

an image receiving layer transfer head which faces a part of the intermediate support on an outer periphery of one platen of said at least one platen,

an image recording section having at least one ink-jet
10 head or toner-jet head which faces a part of the intermediate support on an outer periphery of one platen which is the same as or different from said one platen, and

an image transfer section having

an image receiver and

15 an image transfer heat medium which faces the intermediate support inside the closed loop,

wherein the intermediate support comprises a substrate and a coating film, and

the coating film is formed by applying a coating
20 composition for forming the coating film on at least one main surface of the substrate and then baking it at a temperature of not lower than 140 °C for a time of not shorter than 10 minutes.

7. The image recording apparatus according to claim
25 5 or 6 characterized in that the coating film of the

intermediate support is formed on its back surface and the coating film contains a fluoro-resin as a solid lubricant.

8. The image recording apparatus according to any one of claims 5-7 characterized in that the coating film of the intermediate support contains at least one selected from a polyimide based resin and an epoxy resin as a binder.

9. The image recording apparatus according to any one of claims 5-8 characterized in that the substrate of the intermediate support has a thermal shrinkage of not more than 0.15 % in each of directions parallel to and perpendicular to the longitudinal direction of the substrate of the intermediate support.

10. The image recording apparatus according to any one of claims 5-9 characterized in that the substrate of the intermediate support is in the form of an endless belt having a seam and there is substantially no coating film between the substrates of connected parts at the seam.

11. The image recording apparatus according to any one of claims 5-10 characterized in that the substrate of the intermediate support comprises at least one kind of polymer film selected from a polyamide based polymer and a polyimide based polymer.

12. An image recording apparatus comprising:
an intermediate support which forms a closed loop and

extends over at least one platen,

an image receiving layer transfer section having

an image receiving layer transferer which includes an image receiving layer and

5 an image receiving layer transfer head which faces a part of the intermediate support on an outer periphery of one platen of said at least one platen,

an image recording section having at least one ink-jet head which faces a part of the intermediate support on an
10 outer periphery of one platen which is the same as said one platen, and

an image transfer section having

an image receiver and

an image transfer heat medium which faces the
15 intermediate support inside the closed loop,

wherein the platen on which the image receiving layer transfer section is positioned comprises a heat medium for heating the platen.

13. An image recording apparatus comprising:

20 an intermediate support which forms a closed loop and extends over at least one platen,

an image receiving layer transfer section having

an image receiving layer transferer which includes an image receiving layer and

25 an image receiving layer transfer head which

faces a part of the intermediate support on an outer periphery of one platen of said at least one platen,

an image recording section having at least one ink-jet head which faces a part of the intermediate support on an outer periphery of one platen which is the same as or different from said one platen, and

an image transfer section having

an image receiver and

an image transfer heat medium which faces the intermediate support inside the closed loop,

wherein the image receiving layer transferer including the image receiving layer comprises a laminate of the image receiving layer and an aqueous solvent permeating layer which are laminated on and in the above listed order from a substrate for the image receiving layer transferer.

14. An image recording apparatus comprising:

an intermediate support which forms a closed loop and extends over at least one platen,

an image receiving layer transfer section having

an image receiving layer transferer which includes an image receiving layer and

an image receiving layer transfer head which faces a part of the intermediate support on an outer periphery of one platen of said at least one platen,

an image recording section having at least one ink-jet

head which faces a part of the intermediate support on an outer periphery of one platen which is the same as or different from said one platen, and

an image transfer section having

5 an image receiver and

an image transfer heat medium which faces the intermediate support inside the closed loop,

wherein the image recording section comprises an image drying mechanism which accelerates drying of an image recorded on the image receiving layer.

10 15. An image receiving layer transferer which includes an image receiving layer comprises a laminate wherein the image receiving layer and an aqueous solvent permeating layer are laminated on a substrate for the image receiving layer transferer in the above listed order from the substrate.

16. The image recording apparatus according to any one of claims 1, 2 and 4-14 characterized in that the image receiver comprises cellulose paper of which at least one main surface is laminated with a polyethylene.

17. An image recording method using:

an image forming medium which extends over at least one platen and includes a laminate in which an aqueous solvent permeating layer and an image receiving layer are laminated on and in the above listed order from a substrate

for the image forming medium,

an ink-jet head for recording an image on the image receiving layer,

an image receiver, and

5 an image transfer heat medium for thermally transferring the laminate in which the image is recorded on the image receiving layer from the image forming medium to the image receiver,

wherein the image recording method comprises:

10 an image recording step in which the image is recorded on the image receiving layer of the laminate on the image forming medium by using the ink-jet head in an image recording section, and

an image transfer step in which the image forming
15 medium is heated from its back surface by using the image transfer heat medium and then the laminate in which the image is recorded is transferred to the image receiver in an image transfer section.

18. An image recording method using:

20 an image forming medium which extends over at least one platen and includes an image receiving layer,

an ink-jet head for recording an image on the image receiving layer,

an image receiver, and

25 an image transfer heat medium for thermally

transferring the image receiving layer in which the image is recorded from the image forming medium to the image receiver,

wherein the image recording method comprises:

5 an image recording step in which the image is recorded on the image receiving layer of the image forming medium by using the ink-jet head and an image drying step in which drying of the recorded image on the image receiving layer is accelerated in an image recording section,
10 and

 an image transfer step in which the image forming medium is heated from its back surface by using the image transfer heat medium and then the image receiving layer having the image recorded thereon is transferred to the
15 image receiver in an image transfer section.

19. An image recording method using:

 an image forming medium which extends over at least one platen and includes an image receiving layer,

 an ink-jet head for recording an image on the image
20 receiving layer,

 an image receiver, and

 an image incorporating heat medium for integrating the image receiver with the image forming medium in which an image is recorded on the image receiving layer,

25 wherein the image recording method comprises:

an image recording step in which the image is recorded on the image receiving layer of the image forming medium using the ink-jet head and an image drying step in which drying of the recorded image of the image receiving layer is accelerated in an image recording section, and

an image incorporating step in which the image forming medium is heated from its back surface by using the image incorporating heat medium, so that the image forming medium comprising the image receiving layer on which the image is recorded is integrated with the image receiver in an image incorporating section.

20. An image recording method using:

an intermediate support which forms a closed loop while it extends over at least one platen,

an image receiving layer transferer including an image receiving layer,

an image receiving layer transfer head for thermally transferring the image receiving layer to the intermediate support,

at least one ink-jet head or toner-jet head for recording an image on the image receiving layer,

an image receiver, and

an image transfer heat medium for transferring the image receiving layer on which the image is recorded from the intermediate support to the image receiver,

wherein the image recording method comprises:

an image receiving layer transfer step in which the image receiving layer transferer is heated from its back surface, so that the image receiving layer is thermally transferred to the intermediate support in an image receiving layer transfer section,

an image recording step in which the image is recorded on the image receiving layer of the intermediate support by using the ink-jet head or toner-jet head, and the image receiving layer transfer head and said at least one ink-jet head or toner-jet head face a part of the intermediate support on an outer periphery of a platen which is the same as or different from the platen which they face in an image recording section, and

an image transfer step in which the intermediate support is heated from its back surface by using the image transfer heat medium, so that the image receiving layer on which the image is recorded is transferred to the image receiver in an image transfer section, and

the intermediate support comprises a substrate and a coating film, and

the coating film is formed by applying a coating composition for forming the coating film on at least one main surface of the substrate by using a spraying method.

21. An image recording method using:

an intermediate support which forms a closed loop while it extends over at least one platen,

an image receiving layer transferer including an image receiving layer,

5 an image receiving layer transfer head for thermally transferring the image receiving layer to the intermediate support,

at least one ink-jet head or toner-jet head for recording an image on the image receiving layer,

10 an image receiver, and

an image transfer heat medium for transferring the image receiving layer on which the image is recorded from the intermediate support to the image receiver,

wherein the image recording method comprises:

15 an image receiving layer transfer step in which the image receiving layer transferer is heated from its back surface, so that the image receiving layer is thermally transferred to the intermediate support in an image receiving layer transfer section,

20 an image recording step in which the image is recorded on the image receiving layer of the intermediate support by using the ink-jet head or toner-jet head, and the image receiving layer transfer head and said at least one ink-jet head or toner-jet head face a part of the
25 intermediate support on an outer periphery of a platen

which is the same as or different from the platen which they face in an image recording section, and

an image transfer step in which the intermediate support is heated from its back surface by using the image transfer heat medium, so that the image receiving layer on which the image is recorded is transferred to the image receiver in an image transfer section, and

the intermediate support comprises a substrate and a coating film, and

the coating film is formed by applying a coating composition for forming the coating film on at least one main surface of the substrate and then baking it at a temperature of not lower than 140 °C for a time of not shorter than 10 minutes.

22. The image recording method according to claim 20 or 21 characterized in that the coating film of the intermediate support is formed on its back surface and the coating film contains a fluoro-resin as a solid lubricant.

23. An image recording method using:

an intermediate support which forms a closed loop while it extends over at least one platen,

an image receiving layer transferer including an image receiving layer,

an image receiving layer transfer head for thermally transferring the image receiving layer to the intermediate

support,

at least one ink-jet head for recording an image on the image receiving layer,

an image receiver, and

5 an image transfer heat medium for transferring the image receiving layer on which the image is recorded from the intermediate support to the image receiver,

wherein the image recording method comprises:

10 an image receiving layer transfer step in which the image receiving layer transferer is heated from its back surface, so that the image receiving layer is thermally transferred to the intermediate support in an image receiving layer transfer section,

15 an image recording step in which the image is recorded on the image receiving layer of the intermediate support by using the ink-jet head, and the image receiving layer transfer head and said at least one ink-jet head face a part of the intermediate support on an outer periphery of a platen which is the same as the platen which they face in
20 an image recording section, and

25 an image transfer step in which the intermediate support is heated from its back surface by using the image transfer heat medium, and the image receiving layer on which the image is recorded is transferred to the image receiver in an image transfer section, and

the platen on which the image receiving layer transfer section is positioned comprises a heat medium for heating the platen.

24. An image recording method using:

5 an intermediate support which forms a closed loop while it extends over at least one platen,

 an image receiving layer transferer comprising an image receiving layer,

 an image receiving layer transfer head for thermally
10 transferring the image receiving layer to the intermediate support,

 at least one ink-jet head for recording an image on the image receiving layer,

 an image receiver, and

15 an image transfer heat medium for transferring the image receiving layer on which the image is recorded from the intermediate support to the image receiver,

 wherein the image receiving layer transferer which includes the image receiving layer comprises a laminate in
20 which the image receiving layer and an aqueous solvent permeating layer are laminated on and in the above listed order from a substrate for the image receiving layer transferer, and

 the image recording method comprises:

25 an image receiving layer transfer step in which the

image receiving layer transferer is heated from its back surface, so that the image receiving layer is thermally transferred to the intermediate support in an image receiving layer transfer section,

5 an image recording step in which the image is recorded on the image receiving layer of the intermediate support by using the ink-jet head, and the image receiving layer transfer head and said at least one ink-jet head face a part of the intermediate support on an outer periphery of
10 a platen which is the same as or different from the platen which they face in an image recording section, and

 an image transfer step in which the intermediate support is heated from its back surface by using the image transfer heat medium, so that the laminate which has the
15 image recorded is transferred to the image receiver in an image transfer section.

25. An image recording method using:

 an intermediate support which forms a closed loop while it extends over at least one platen,

20 an image receiving layer transferer including an image receiving layer,

 an image receiving layer transfer head for thermally transferring the image receiving layer to the intermediate support,

25 at least one ink-jet head for recording an image on the

image receiving layer,

an image receiver, and

an image transfer heat medium for transferring the
image receiving layer on which the image is recorded from
5 the intermediate support to the image receiver,

wherein the image recording method comprises:

an image receiving layer transfer step in which the
image receiving layer transferer is heated from its back
surface, so that the image receiving layer is thermally
10 transferred to the intermediate support in an image
receiving layer transfer section,

an image recording step in which the image is
recorded in the image receiving layer of the intermediate
support by using the ink-jet head, and the image receiving
15 layer transfer head and said at least one ink-jet head face
a part of the intermediate support on an outer periphery of
a platen which is the same as or different from the platen
which they face in an image recording section, and

an image transfer step in which the intermediate
20 support is heated from its back surface by using the image
transfer heat medium, so that the image receiving layer on
which the image is recorded is transferred to the image
receiver in an image transfer section, and

the image recording section comprises an image
25 drying mechanism which accelerates drying of the recorded

image on the image receiving layer.

26. The image recording method according to any one of claims 17-25 characterized in that the image receiver comprises cellulose paper of which at least one main surface is laminated with a polyethylene.
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